

Hood Canal Bridge Rehabilitation

Update for the Washington State Transportation Commission

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**Washington State
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The Hood Canal Bridge Rehabilitation Program

1961 – Original bridge opened

1979 – West half sinks

1981 – New west half opened

1997 – Bridge condition assessment study

- Drawspan unreliability
- Aging concrete and corroding steel
- Storm vulnerability
- Substandard roadway widths

Objectives of the Program

- Replace east half with 14 new and three refurbished pontoons and roadway structure with wider lanes and shoulders
- Replace electrical and mechanical systems
- Widen west half roadway on top of existing pontoons for wider roadway and shoulder
- Install leak detection system



1979 Sinking



Malfunctioning Drawspan Roller system



Deteriorating concrete and corroding reinforcing steel

The Drivers of the Pontoon and Anchor Construction Program

- To minimize bridge closure time, all new pontoons must have new roadway structure preconstructed before float-in.
- Roadway structures could not be added on to new pontoons at near-site moorage location because of unacceptable “fish migration shadow” impacts (Endangered Species Act). Near simultaneous pre-positioning of all pontoons would be necessary to meet one season “fish window” work period (ESA)
- All anchors should be ready and placed one year in advance because of limited “fish window” period for in water work at the bridge site.

Site(s) must be found to construct all pontoons to support near – simultaneous moving of completed pontoon/roadway structures to HCB site just prior to float-in. The same for all anchors presumably in the previous year’s “fish window.” A site must be found for anchor construction as well.



Bridge Superstructure on top of pontoons



1980 Float in of West Half pontoons

Site Evaluation for Pontoon/Anchor Fabrication

- No apparent site – existing or potential – offered ability for simultaneous construction.
- In November 2001, entire Hood Canal Bridge project was selected as “permit streamlining” pilot project for TPEAC.
- TPEAC “Interdisciplinary Team” met 24 times from March 2002 to June 2003.
 - Permitting agencies pressed WSDOT to specify pontoon and anchor construction site. “Streamlined permit process” could not accommodate the uncertainty of “leave site up to the contractor” approach.
 - Port Angeles site (see next page) was identified as most desirable for construction consistent with TPEAC permitting approach, November 2002 .
 - Numerous additional permitting issues, such as impact on fish inadvertently swimming into graving dock when pontoons were floated out, also had to be addressed. *Cultural resource concerns were not included in TPEAC “environmental permit streamlining” emphasis.*



Concrete Tech Graving Dock



Pontoons and anchors at Blair Waterway Graving Dock

Identification, Evaluation and Tentative Selection of the Port Angeles Site

- WSDOT approached by Port Angeles officials about 32 acres available at the Port of Port Angeles, *June 2002*.
- Site tour opened up ideas for both pontoon and anchor construction. Also possible later use for future SR 520 bridge project pontoons.
- TPEAC “Interdisciplinary Team” liked site as potentially attractive for permitting.
- WSDOT settles on Port Angeles site for Graving Dock in *November 2002*, subject to permitting and finalizing lease or purchase discussions with Port, based on cost.

Permit Agency	Principal Permitting Concerns in TPEAC Pilot Project for Permit Streamlining*
City of Port Angeles	Substantial Development Permit
City of Port Angeles/Clallam County	Clearing and Grading Permit
City of Port Angeles	Building Permit
Dept. of Ecology	Coastal Zone Management Consistency
Dept. of Ecology	Section 401, Water Quality Certification
Dept. of Ecology	National Pollutant Discharge Elimination System for Stormwater discharges
Dept. of Ecology	National Pollutant Discharge Elimination System Industrial Stormwater General Permit
Dept. of Fish and Wildlife	Hydraulic Project Approval
U.S. Army Corp of Engineers	Section 404/10 individual permit
USF&W & NOAA Fisheries	Endangered Species Act, Biological Opinion Draft Conditions and Final Biological Opinion

* Approximately fifty percent of the project permitting effort for the entire project was associated with the graving dock.

Cultural and Historic Resources and Tribal Consultation for the Port Angeles Site

Private consultant **Western Shores Heritage Services** performed archaeological site survey for WSDOT in *October – December 2002*.

- Historical Research
- Trenching
- Borings

Survey was limited by on-site concrete slabs and buildings; investigation only went to proposed depth of construction.

Conclusion of Western Shores Heritage Services report:

*No evidence for significant prehistoric or historic archaeological resources was found within the boundaries of the proposed project site during these investigations...Based on the results of this survey, the probability for the occurrence of buried archaeological resources is determined to be low; however, **it is recommended that an archaeological monitor observe ground disturbing activities during construction of the Graving Dock Facility in those areas where excavations will exceed four feet in depth.***

Archaeological site survey was transmitted to the Lower Elwha Klallam Tribe on *January 13, 2003*.

Tribal Response, **February 5, 2003**

*"The proposed site within Port Angeles has clearly been significantly altered, however its proximity to known Klallam Village sites and traditional use areas **argues strongly for caution...** In the unlikely event of an inadvertent discovery of archaeological materials at any depth, work will be stopped and contact made with the tribe in addition to the Washington SHPO."*

February 5, 2003, Letter from the Lower Elwha Klallam Tribe Chairman Dennis R. Sullivan, Tribal Chairman



2000 view of Port Angeles (graving dock site).



1914 view of Port Angeles (view from SE) with approximate location of graving dock superimposed.

Cultural and Historic Resources and Tribal Consultation (2)

Subsequently, the Tribe prepared an analysis of the 1853 U.S. Coast and Geodetic Survey Chart that showed the site of an Indian Village in the area in order to try to pinpoint its location in relation to the proposed Graving Dock construction.

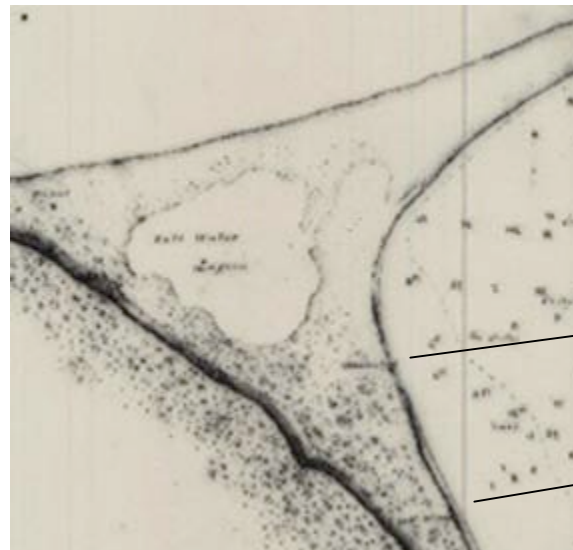
Conclusion

"The graving yard footprint is generally located to the northwest of the intersection of Marine Drive and Hill street while the extreme limits of the village is to the south and east of the intersection. There does not appear to be a conflict based on the methods of locating the village described above."

Report on the location of the Village of Tse - whit-sen, based on an analysis of the 1853 Map of Dungeness Harbor by the U.S. Coast Survey – Prepared for the Lower Elwa Tribal Council, June 16, 2003



1853 Coast and Geodetic Survey Chart



Observatory

Indian Village

Construction Plan and Early Construction Activities

- Construction documents were prepared following the recommendation of Western Shores Heritage Services and consultation with the Tribe that provision be made for an archaeological monitor.
- The contract was advertised, bid and awarded in *February - July 2003*.
- Groundbreaking ceremony was held *August 6, 2003*.
- Early construction planned sequence included site clearance, drainage installation, grading of upper graving dock area, placing of specialty steel sheet pile walls, and excavation of lower graving dock area.
- Site work began on *August 11, 2003*.



First Discovery of Remains and Triggers of Monitoring Activities Provided for in the Contract

- **August 16, 2003** – WSDOT inspector finds first indication of shell midden below concrete slab. Contractor is moved immediately away from that area and call is placed to the staff archeologist and WSDOT executive management.
- **August 18, 2003** – Following monitoring plan in the contract, Tribe notified, Tribes archaeology consultant, Larsen Anthropological Archaeological Services Limited comes to site.
- **August 20, 2003** – First human bone fragment found.
- **August 26, 2003** – WSDOT issues construction shutdown order.

Government to Government Consultation With Tribe Guided by “Inadvertent Discovery” Provisions of the National Historical Preservation Act.

Lower Elwha Klallam Tribe, WSDOT, State Historic Preservation Office, Federal Highway Administration and U.S. Army Corps of Engineers hold first meeting at Lower Elwha Tribal Council in Port Angeles.

August 25, 2003

Tribe's spiritual advisers conduct **traditional burning ceremony** on tribal reservation; WSDOT and contractor personnel participate fully at the Tribe's invitation and request. *August 30, 2003*

Consultation process leads to **additional archaeological site assessment** prepared by Tribe's archaeological consultant, **Larsen Anthropological Archaeological Services Limited. (“LAAS”)** *September, 2003*. Results find partial remains of twelve adults, one child, no intact burials. Custody of all human remains are placed with Tribe and accorded appropriate traditional ceremonial attentions and respects. Archeological areas A,B, C and D are identified as significant archaeological areas. *October 3, 2003*

Site determined eligible for listing on National Register of Historic Places. *October 9, 2003*

Months of negotiation by all parties and their legal counsel (also archaeologists, spiritual advisors, and tribal community members) to reach a **Memorandum of Agreement** under Section 106 of the National Historic Preservation Act and an accompanying **Site Treatment and Monitoring Plan** developed by the Tribe's archaeology consultant, LAAS, in conjunction with the State Office of Archaeology and Historic Preservation. *October 2003 - March 2004*

Federal Highway Administration, U.S. Army Corps of Engineers, State Office of Archaeology and Historic Preservation, Lower Elwha Klallam Tribal Council and WSDOT approve final Section 106 **Memorandum of Agreement** and **Site Treatment Plan**. The two documents guide the methodology for further archaeological work and burial removals while allowing construction to proceed for the project. The **Memorandum of Agreement** also includes a provision that tribal members will be working in conjunction with the archaeologists. A **Mitigation Agreement** is also signed by the Tribe and the State of Washington (WSDOT). March 16, 2004

Commitment of all parties is to **Walk Together** through forthcoming process expected to include further archaeological discoveries including likely discovery of human remains.

Site Treatment Plan -- Provided for the Further Archaeological Work

- Research to identify the nature and extent of the archaeological site.
- Recovery of culturally and historically significant artifacts and recordation of important features (“data recovery”) from identified sample locations across the site.
- Provisions for appropriate and respectful procedures whenever human remains were encountered.
- Scientific analysis, reporting, preparation of public information and educational materials.

At the request of the Tribe, the Tribe’s archaeological consultant, LAAS, was engaged by WSDOT to perform the Site Treatment Plan. Later, again at the Tribe’s behest, the original archaeological consultant, Western Shores Heritage Services, was retained to continue with burial recoveries outside of the archaeological site area.

Memorandum of Agreement – Provided NHPA Section 106 Provisions

- Parties would work together to provide public information while protecting sensitive information about archaeological recoveries.
- Archaeological monitoring would be performed during the construction activities to allow the project to move ahead while permitting the identification and removal of all archaeological discoveries and human remains.
- Extent of analysis was determined in order to allow for public knowledge while ensuring the comfort of the Tribe that is of a spiritually sensitive nature.
- Parties would assist the Tribe in locating land for reinterment of human remains and WSDOT would assume costs of reburial.

WSDOT – Tribe Mitigation Settlement Agreement and Legal Release

- Lump sum mitigation payment of \$3.4 million to cover cost of purchase of reburial property and costs of reburial, costs of temporary and permanent curation of artifacts, costs of tribal staff, legal and archaeological consultants and staff, and costs of appropriate ceremonies.
- Tribe releases the State of Washington from future liability or litigation.
- Tribe and WSDOT re-affirm “Walk Together” approach to future activities at the site.

2004 Archaeological and Construction Activities

As area by area was examined and then cleared through the Site Treatment Plan, construction work proceeded as possible.

The workforce on the site during the course of the summer included:

- As many as 45 trained and qualified professional archaeologists
- As many as 75 tribal members, mostly youth, employed as archaeological trainees.
- As many as 75 construction workers and contractor staff
- At various times, 6 to 15 WSDOT staff and inspectors

Over the course of the summer, construction progress included:

- 75% of drainage system installation
- Excavation/ grading of 90% of upper graving dock to subbase level and 25% of concrete slab installation
- 70% of sheet pile installation
- Installation of coffer dam at shoreline for lower graving dock construction

Archaeological process included almost all of the stipulated “data recovery” under the Site Treatment Plan and as the plan was extended during the course of the summer.



As the Summer Went on, the Significance of the Archaeology and the Scale of the Human Remains Issue Grew and Grew.

Human Burials

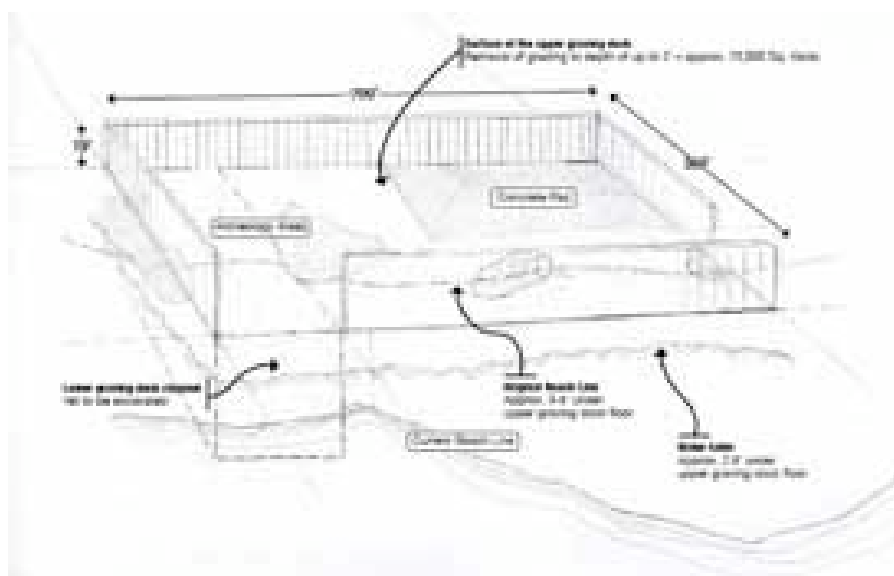
First intact burials were discovered during early excavation for drainage lines. The number steadily increased, including apparent victims of eighteenth century smallpox epidemic. Additional archaeology team was brought on in September to assist in burial recoveries.

The burden of the disturbance to ancestral resting places became greater and greater on members of the Tribe and others.

Archaeological Discoveries

Important archaeological findings reached back to ancient habitations 17 centuries old and to contact and post-contact era settlement of the last two centuries. Evidence of long houses, food processing pits, and ceremonial areas, as well as recovery of tools and other artifacts of everyday life and spiritual significance grew. The areas of investigation on the site were expanded.

It has become clear that the site is one of the most important Native American archaeology sites ever found on the Northwest Coast.



Discussions on Whether and How to Proceed

- The Tribe's initial desire to disturb as few burials as possible began to change in *May 2004*. Should *all* burials possibly under as well as within the envelope of site construction be removed for re-burial?
- Where would the search for burials lead and how could it be conducted? If issues of time and cost could be resolved, what about the complexity of seeking and recovering burials from at or below the modern water table in the vicinity of the historic beach line?
- In May, and in detail in September, a Tribal proposal requested major and indeterminate further efforts. WSDOT sought interpretation from FHWA of the bounds of the Site Treatment Plan and the original Memorandum of Agreement before considering further proposals of indeterminate scale. ("No burial left behind") *October 26, 2004*
- FHWA issued determination as to bounds of agreed-upon archaeological efforts under March agreement. *November 23, 2004*
- WSDOT at on-site meeting in Port Angeles requested new tribal proposal for efforts "above and beyond" the bounds defined by March agreements. *December 1, 2004*
- On *December 10, 2004* Chairwoman Charles wrote to Secretary MacDonald stating:

"We know that you and your colleagues at WSDOT have made every effort, and are willing to continue to make efforts, to save our burials. However, recent events have made it clear that this will be extremely difficult, if not impossible to accomplish – not because of anyone's lack of willingness to try but because of the physical problems involved."

If the Answer is for WSDOT to Leave the Graving Dock Site, What Lies Ahead for the Hood Canal Bridge Rehabilitation Program?

- A large portion of the work under the contract at the existing bridge can and should be completed.
- A new plan will have to be devised for fabricating the new anchors and pontoons, moving them to the bridge, installing the new bridge elements, and completing the final elements of the project.
- Obstacles and challenges that first led the project work to the Port Angeles site for anchors and pontoons will certainly have no easier solutions now than in 2002.

Major Work on the Program Has Been Performed and Will be Completed on the Bridge Itself Under This Contract

- West half widening will be completed.
- West half Electrical/Mechanical upgrades will be partially completed.
- West half new transition span will be completed.
- West half leak detection system will be completed.
- East half new transition span will be fabricated and stored for later use.
- East and West half approach spans will be completed.



Existing



Visualization

A New Plan Will Have to be Prepared for Pontoons and Anchors

The new plan will need to provide for:

- Pontoon and anchor fabrication
- Set anchors
- Final bridge assembly (float in pontoons, connect anchor cables)
- Place east transition span

Permitting and construction challenges continue:

- “Fish window” restrictions and “habitat shadow” constraints on pontoon moorage (ESA): Will they continue?
- Other water quality and water work issues.
- Re-open NEPA/SEPA process?
- Long permit processing times?
- Where and how will anchors and pontoons be built?



Critical Concerns

- Progressive deterioration of the old bridge including new concerns about integrity of anchor cables.
- Economic, public safety and convenience concerns for avoiding extended closure.
- Likely high cost of the “next best” plan.

Potential Plan B Options

A Baseline Option: May or May Not be Option of Choice

Delete the anchor/pontoon requirement from the current contract. Seek competitive proposals and bids from contractors who would assume anchor/pontoon supply and contract interface and completion responsibilities.

- Resembles a “design/build” approach with contractor assuming the problem of how to get the pontoons fabricated and in place.
- The risks that will be borne by the contractor to find the site and obtain necessary permits will be “paid for” by the contractors’ taking them into account in judging their bids.
- Many “interface” risks with the work performed under the current contract will be difficult for WSDOT to get new contractors to accept. (New contractor will expect WSDOT to pay when something doesn’t “fit”.)
- Regulators were previously sensitive about issuing any of the critical permits on a “sight unseen” basis as to the contractor’s pontoon and anchor approach. This was an important factor that led to WSDOT’s undertaking to provide the siting and permitting of the graving dock as a “given” in the specifications for the previous bid. One way or another, “here we go again. . . “
- Incentives and liquidated damages for schedule performance will be important to include and tricky to set. WSDOT does have experience in this area, however.
- Engaging the innovative skills of major contracting firms is appealing. The risks of a thin bidding environment (especially with limited potential access to critical facilities—this is the Woodrow Wilson Bridge bid bust problem*) requires great caution and careful management and structuring of the bidder environment.

* The “Woodrow Wilson bridge bust problem” achieved wide notoriety in 2002 and was one of the factors encouraging WSDOT to purchase and specify the Port Angeles graving dock site in order to encourage multiple bidders interest in the project.

Another Option: Likewise May or May Not be the Right One.

Delete the anchor/pontoon requirement from the current contract. WSDOT secures new pontoon/anchor site(s) and approach and secures regulatory approvals. Seek competitive proposals and bids from contractors who would perform work under a new specification.

- Closer to conventional “design/bid/build” approach. Loses the advantage of a contractor being able to compress schedule through performing activities concurrently.
- The contractor will bear less risk in this approach and this should be reflected in lower bids, everything else being equal. But WSDOT can also lose this risk bet, as seen to be turning out in the case of the Port Angeles graving dock.-- About the worst imaginable “unforeseen site condition” situation.
- This option is the same as the previous option in the problems it presents by contractors’ likely unwillingness to assume the “interface” risks with the work performed under the current contract. (New contractor will expect WSDOT to pay when something doesn’t “fit.”)
- This approach was the only approach that regulators were comfortable with on a “streamlined” permitting approach in the TPEAC program previously used. Will WSDOT again be pushed in this direction? One way or another, “here we go again...”
- The approaches to incentives and liquidated damages will be somewhat different in this option than under the previous option, but the pattern of their use will be more or less equally as familiar to WSDOT.
- This approach is not as attractive in enlisting contractor innovation and entrepreneurship. On the other hand, it is the approach that provides WSDOT with the best protection against a thin or uncompetitive bidding environment.

A Third Option: Likewise May or May Not be the Right One.

Negotiate with the current contractor, through the process of a “cardinal change,” a mutually agreed substitute course of action to provide the anchors/pontoons under a new plan.

- This is the “change order” option, but it’s a big change order and will have to be negotiated and pass legal muster under rules applicable to a “cardinal change.” It loses the discipline of a competitive bid but may gain other advantages in the experience that the contractor has already gained in planning the work.
- Various risk scenarios are consistent with this approach.
- This option, unlike the other two, should allow WSDOT to avoid the “interface” risk.
- This approach will have to determine and take into account how the permitting agencies will approach the new work. In addition to the Endangered Species Act issues, will new and extensive requirements be invoked under NEPA/SEPA?
- Incentives and liquidated damages can be integrated into this option.
- This approach may have considerable appeal if the existing contractor can develop a creative plan. It helps with the “critical facilities” problem (Woodrow Wilson Bridge) because all the creative opportunities of all outsiders will be challenged to one actor, the existing contractor. But this is at the risk of foregoing other contractors’ entrepreneurship *and* entering the very difficult financial and public perception perils of a “no bid” change order.

Abandoning the Port Angeles Site Will Lead to Some Prompt Decisions and Others That Will be Much More Difficult and Extended.

Work is already underway on:

- An update on all available information about possible graving dock locations. This includes options previously studied as well as new ideas that have been arriving because of the recent publicity about the Port Angeles site. WSDOT will very shortly pass the word formally that it is “in the market” for graving dock possibilities.
- Work-up of adjustments to cash flow and other budgeting assumptions from an abandonment of graving dock work at Port Angeles and the resulting likely slippages in cash flow schedules and growth in total cash flow requirements.
- Preparation of a contract approach for an extensive program for anchor cable rehabilitation for the east half pontoons.

Actions would seemingly take place in the near future on:

- Resolution of numerous issues with the Tribe about specific terms for unwinding the project in relation to capping and security at the site. Others will probably enter discussions about important questions such as long-term status and ownership of the site.
- Discussions with the contractor on implications of continuing some aspects of the contract while either deleting or restructuring others. Consideration of additional program management resources to help develop and implement the best option for a new contract approach. Additional work also must be done on possible use of innovative approaches in pricing and risk management under any of the three contract options outlined above, or others.

The actual decision and implementation of the new contracting approach is not going to be a matter quickly, easily or lightly settled on.